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# **Space Market Model Development Project**

## **Phase II Report**

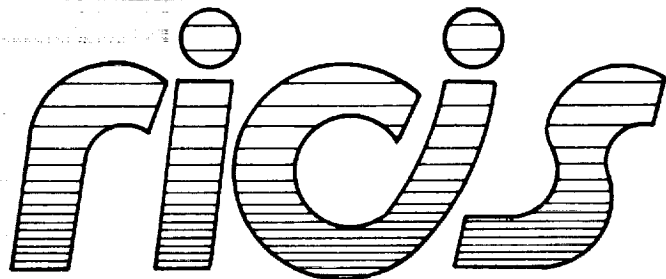
**Peter C. Bishop**

**University of Houston-Clear Lake**

**June 1988**

**Cooperative Agreement NCC 9-16  
Research Activity IM.1**

**NASA Johnson Space Center  
Mission Support Directorate  
Mission Planning and Analysis Division**



**Research Institute for Computing and Information Systems  
University of Houston - Clear Lake**

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(NASA-CR-187250) SPACE MARKET MODEL  
DEVELOPMENT PROJECT, PHASE 2 (Houston  
Univ.) 41 p

## ***The RICIS Concept***

The University of Houston-Clear Lake established the Research Institute for Computing and Information systems in 1986 to encourage NASA Johnson Space Center and local industry to actively support research in the computing and information sciences. As part of this endeavor, UH-Clear Lake proposed a partnership with JSC to jointly define and manage an integrated program of research in advanced data processing technology needed for JSC's main missions, including administrative, engineering and science responsibilities. JSC agreed and entered into a three-year cooperative agreement with UH-Clear Lake beginning in May, 1986, to jointly plan and execute such research through RICIS. Additionally, under Cooperative Agreement NCC 9-16, computing and educational facilities are shared by the two institutions to conduct the research.

The mission of RICIS is to conduct, coordinate and disseminate research on computing and information systems among researchers, sponsors and users from UH-Clear Lake, NASA/JSC, and other research organizations. Within UH-Clear Lake, the mission is being implemented through interdisciplinary involvement of faculty and students from each of the four schools: Business, Education, Human Sciences and Humanities, and Natural and Applied Sciences.

Other research organizations are involved via the "gateway" concept. UH-Clear Lake establishes relationships with other universities and research organizations, having common research interests, to provide additional sources of expertise to conduct needed research.

A major role of RICIS is to find the best match of sponsors, researchers and research objectives to advance knowledge in the computing and information sciences. Working jointly with NASA/JSC, RICIS advises on research needs, recommends principals for conducting the research, provides technical and administrative support to coordinate the research, and integrates technical results into the cooperative goals of UH-Clear Lake and NASA/JSC.

***Space Market Model Development Project  
Phase II Report***



## **Preface**

This research was conducted under the auspices of the Research Institute for Computing and Information Systems by Dr. Peter C. Bishop, Director of the Space Business Research Center at the University of Houston-Clear Lake. Dr. Bishop also served as RICIS technical representative for this activity.

Funding has been provided by the Mission Planning and Analysis Division within the Mission Support Directorate, NASA/JSC through Cooperative Agreement NCC 9-16 between NASA Johnson Space Center and the University of Houston-Clear Lake. The NASA technical monitor for this activity was Kenneth Demel, Space Station Project Office, NASA/JSC.

The views and conclusions contained in this report are those of the author and should not be interpreted as representative of the official policies, either express or implied, of NASA or the United States Government.



**SPACE MARKET MODEL DEVELOPMENT PROJECT**

**NASA CC 9-16 IM.1**

**Phase II Report**

**prepared for**

**National Aeronautics and Space Administration**

**Lyndon B. Johnson Space Center  
Office of Commercial Programs  
Space Station Utilization Office**

**prepared by**

**Peter C. Bishop, Ph.D.  
Space Business Research Center  
University of Houston-Clear Lake**

**June 1988**





## 1.0 BACKGROUND

The Space Market Model Development Project is a joint research project conducted by NASA and the University of Houston-Clear Lake. The project's purpose is to investigate the information available and the information essential to businesses in their pursuit of commercial ventures in space.

The Project began in August 1986 with the following goals:

1. To survey and collect business information used in the commercial development of space.
2. To study the information that the business community needed to support commercial ventures in space.
3. To design a mechanism for providing the required information in an effective manner.

Phase I of the research project concluded in May 1987 and the report of that phase was published the following month. That report contained the design for a mechanism to provide the required information, the Space Business Information Center.

The second phase of the research project began in June 1987. The primary purpose of this stage was to evaluate the feasibility and effectiveness of the design conceived in the first phase. To accomplish that, a prototype Center was established and maintained so that data on its operations and performance could be collected.

This second phase officially concluded at the end of April 1988. This document contains the results of the prototype operations of the Space Business Information Center. It's Phase II goals were:

1. To conduct a clearinghouse for space business information for members of the U. S. space industry-composed of public, private and academic sectors. Existing information, that could be accessed and did not require original research, was provided without charge. Statistics were compiled about the individuals who called and the types of requests they made.
2. To publish "business guidebooks" on major markets in space business. The markets selected were space transportation and the space-based remote sensing of land areas. The books are data-intensive reference works containing extensive facts and figures about these markets. Other types of publications were also to be produced as needs and opportunities were identified.
3. To conduct proprietary research and briefings for firms and agencies in the space industry.

## 2.0 RESEARCH RESULTS

The goals of the Space Business Information Center also comprised a three-way strategy to continue the research begun in Phase I. The following sections summarize results of the latest research.

### 2.1 INFORMATION CLEARINGHOUSE

The information clearinghouse collected data in two ways. Behavioral statistics were recorded as requests were received and information was transmitted. These statistics indicate the nature of requests and the types of clients who made them.

Evaluation statistics were obtained by contacting individuals who had received information and asking them to rate the Center on several criteria.

#### 2.1.1 Behavioral Statistics

The Center officially started accepting requests for information in September 1987. However informal requests had been accepted as early as February 1987. Last September, the Center mailed letters and brochures announcing the clearinghouse to 350 people who had expressed an interest in it.

The Center responded to 274 information requests through April 1988. The number of inquiries averaged 20 - 30 per month

throughout the prototype period (See Appendix A, Figure 1). These results indicate a need for information exists that has not yet been satisfied.

These requests were made by 172 clients. Appendix A, Table 2, lists the number of requests each client made. A total of forty-six clients (27%) contacted the Center more than once. One client, in fact, contacted the Center 12 times. The number of clients who contacted the Center repeatedly indicates that the information they received initially was useful enough to make them request more.

Another significant dimension of the research is underscored by the categories of clients who made the requests. The Center's clientele represents the industry segments projected in the Phase I report.

"The business services sector indicated greatest need for information about the commercial space market...The most likely clients for a new information system in space commercialization [are] business services and government agencies involved in space commercialization. The other high-need sectors (aerospace and entrepreneurs) also are potential customers but only under special circumstances."  
(Space Market Model Development Project, Phase I, Final Report, pp II-10, II-14)

The business service community accounted for exactly half of all requests (Appendix A, Figure 3). Government officials (17%) and academics (13%) were the next largest client groups. Contacts by entrepreneurial firms (6%) were lower than expected during this phase when information was provided free of charge. Other categories of clients, as anticipated, represented a small fraction of the total.

The types of information requests received also followed a pattern discerned in the Phase I research.

"The most critical need was reported to be directory information...Another identified area was the need for consistent and believable market statistics for business planning." (Space Market Model Development Project, Phase I, Final Report, pp II-8, II-9)

The questions were classified into the categories listed in Appendix B. Over 35% of the questions were for directory information (Appendix A, Figure 5). Other categories that drew a significant number of requests were: market studies (15%), government contracting (12%), space technology (11%), and document information (9%).

Behavioral statistics also gave indications of how well the Center performed its function of providing timely and accurate

information on space business. The quality and usefulness of the data will be discussed later. The only conclusions the behavioral statistics firmly demonstrate relate to the time it took to fill clients' requests.

The initial procedure to fill a request was the following:

1. Log the request.
2. Scan the Center's library and on-line databases to locate materials useful in answering the question.
3. Order or otherwise acquire the best material(s).
4. Call the client back within 48 hours and update the individual on the work already done.
5. Send the material to the client when all of it had been received.

Mid-way through Phase II, clients' comments indicated the material was not received soon enough. The problem was the time lag between steps 4 and 5 that the Center could not control. A new procedure was adopted through which the staff sent the client whatever material was on hand at Step 4, and mailed additional material as it arrived. Feedback received since that change was implemented was much more positive than under the previous procedure.

The staff time needed to answer requests also was analyzed. The amount ranged from 15 minutes to 6 hours, with a median of 2 - 2.5 hours per request.

### 2.1.2 Evaluation Data

The criteria for successfully operating an information clearinghouse, as outlined in the Phase I report, are:

Visibility

Accessibility

Timeliness

Quality

Utility

Since behavioral statistics give only an indirect indication of how well the prototype met these goals, an evaluation instrument was developed to directly measure the Center's success in achieving them (Appendix C).

A small sample of clients was selected to receive this questionnaire last November. Respondents provided helpful comments about the questionnaire, and its format was proven satisfactory. Of sixteen questionnaires mailed in November, five were returned.

Since it is difficult to get sufficient response rates from mailed surveys, the polling method was changed to gather data by telephone. All information requests for the months of September through December were screened to compile the list of clients to contact. A total of fifty telephone interviews were conducted.

Overall, respondents were positive in their evaluation of the Center and supportive of its efforts (Appendix C). The clients indicated that the Center was easily accessible and that the individuals who handled their requests were very helpful. Most people were satisfied with the information they received. In terms of the amount of information received, about half the respondents said it was "just right", and only a few said they received too much. Over one-third, however, indicated they would have preferred more information.

The format of information responses and the manner of delivery (usually a telephone report followed by mailed materials) were rated favorably. Response time was acceptable, with about one-third of clients indicating the staff responded "rapidly". A majority of the respondents said the information was useful to them.

Most people had difficulty placing a dollar value on the information they received. Of nineteen responses, the median price range quoted was \$50 to \$100.

Respondents also offered numerous helpful suggestions. Various clients suggested that the Center:

- \* Provide on-line access
- \* Publish a newsletter
- \* Increase advertising and communications programs
- \* Refine methods to help clients specify the nature of information needed
- \* Offer a subscription service



### 2.1.3 Conclusions

Two key conclusions emerged. The prototype Center successfully filled the majority of its clients' requests. Clients were satisfied both with the quality of the information they received and the promptness of its delivery. The number of repeat clients illustrates these findings.

The other conclusion, however, was that as many as one-third of the clients did not find the information useful. In those instances, either the Center overlooked some of the information which could have been sent, or the client expected more from the data than was possible.

In some cases, the Center did not send complete information for reasons of effectiveness and economy. One of the Center's initial assumptions was that clients needed information either because they had too little data, or too much. The Center's goal was to offer "just the right amount of information" - the amount that could be easily assimilated and satisfy the client's need. In some cases, the estimate of the "right amount" was incorrect. Furthermore, the new operation understandably erred more on the side of economy than of surplus in allocating manpower.

In other cases, dissatisfaction was attributable to clients' expectations. Some clients already had all the published information available on a topic. Further information would have to be originated through expensive surveys or data analysis. In these cases, clients were not satisfied with the information they

received because it did not increase their expertise. Client dissatisfaction was more prevalent among those already well versed in a subject area than among less knowledgeable clients.

Frequently, clients who had worked in a business area for some time would request data for their area. The information provided would be inadequate because the client knew the area better than the staff did. This does not present a problem because the Center's strength lies in the breadth of its coverage rather than the depth. That breadth is more valuable for people entering a business than for those already established. The latter group usually considers its information sources adequate to its needs, and does not seek nor usually would be satisfied with information from other sources.

A clearinghouse for publicly available information will need government support to maintain operations. One of the findings of the Phase I research was that clients had tremendous difficulty acquiring even publicly available data about space business. However, this finding was not substantiated by the Phase II operation. Many clients, after receiving the information they requested, indicated they already had it.

One way to serve these clients would be to change the type of information supplied to answer their requests by adding some analysis or interpretation. It is possible that even a small amount of value-added processing would make the information significantly more useful for these and other clients. However, analysis takes time and is expensive. It may be necessary to

adjust the Center's funding to fulfill this need for information analysis.

The conclusions of the Phase II clearinghouse research are:

1. The business community is seeking information on the commercial uses of space.
2. The information most often sought is directory information, such as the names of firms in a particular market.
3. The information is sought by individuals in the business service sector more often than by people in other sectors of the space industry.
4. The Center is visible and accessible enough to support a steady flow of requests.
5. Clients receive timely delivery of accurate information.
6. Some clients need additional information requiring original research.

## 2.2 PUBLICATIONS

An information service is only one means of disseminating data to the business community - publication is another. The Center has developed a set of printed materials to be distributed during Phase III. Since these publications have not yet been

disseminated, no statistics exist to gauge how well they will meet the information needs of the space business community. However the following have been written and edited to amplify as well as augment the Center's efforts.

### 2.2.1 Business guides

Reference books on two space markets are in the final stages of development. One book contains comprehensive information on the space transportation market; the other focuses on the space-based remote sensing of land areas. Each book contains pertinent business information on its respective market, including an introduction to the industry, statistical tables, copies of applicable laws and regulations, acronym definitions and references for further information.

Copies of the Business Guide to Satellite Remote Sensing of Land Areas are being distributed for review this month. The draft copy of the Business Guide to Space Transportation is being finalized for editing and review. Funding to publish the books is being sought from leading companies in those markets.

### 2.2.2 Space Business Briefs

Another series of publications is already helping to disseminate industry information and increase public interest in

space. Called the Space Business Brief, each report contains a short analysis - backed by detailed information - about a topic of particular interest to the space business community.

The first Brief, which outlined the presidential candidates' positions on the space program, was published January 30. Copies were mailed to clients who had requested this information, and to the news media and the candidates' campaign headquarters. Reports of the Brief appeared in Space Daily and Space Business News. Within one week of the Brief's publication, a Voter's Guide was released by SpaceCause, a national lobbying organization.

A second brief detailing "The Impact of the Space Station Impact on the Houston Economy" was distributed March 1988. The economic impact analysis spawned widespread local media coverage lauding the Johnson Space Center.

Other briefs will be developed on topics where the business community needs more information or deeper analysis than ordinarily provided by the news media. Possible topics for additional Briefs include:

- . The problems that orbital debris pose for space business.
- . A forecast of the space-based production of gallium arsenide.
- . The business context for the payloads aboard STS-26 and subsequent commercial Shuttle missions.

### 2.2.3. Space Business Review

The Center is completing the prototype of a publication specifically designed to foster broader participation in the space industry. The content and writing of the Space Business Review are tailored to the needs and interests of the industry's major members as identified in Phase I and confirmed in Phase II: business service professionals, government officials and members of academe.

The prototype's target audiences, content, format and conceptual design have been determined; most of the articles, information tables and artwork have been completed, and the rest are in final edit; and a printer's proof will be ready within a month. If funding for a limited press run is received, the Center will distribute copies to key individuals in the target groups and survey their opinions about the publication.

### 2.3 Research contracts and briefings

Efforts to market the value-added services of the Center to the business community were disappointing. Only one small contract, to familiarize a firm with the Space Station program, was received. With that exception, the Center was unable to generate business community interest in focused research projects.

Much of the disinterest stems from the standstill in the space industry. The Shuttle has not flown for over two years,

and commercial ELV's are not yet ready for operations. As a result, businesses are not investigating new opportunities in space and are reluctant to commit funds to such ventures.

In addition, the Center has not had the funds to develop and sell research services. NASA funds were disallowed for this purpose, and private sources were not forthcoming. Government research contracts for space commerce were let during Phase II, but the Center was not equipped to respond to that opening.

#### 2.4 Conclusions

The prototype Space Business Information Center was an effective mechanism to provide information about space to the business community. The Center was accessible to a large number of clients, primarily from the business service community, who previously had little contact with the space program. The Center furnished them accurate introductory material on space business in a timely fashion.

The prototype Center was not rated highly by people already knowledgeable about space. For them, the information often was superficial and dated. Also, it was impossible to get serious investors and entrepreneurs to fund in-depth research due to the current low level of business activity in the industry.

The Center is a vehicle to reach one segment of the business community, the larger segment that is not yet adept in space business. The Center should be viewed as one of several mechanisms which NASA and other government agencies should

consider in planning to supporting the business community in its quest for commercial ventures in space.

### 3.0 PHASE III PLANS

The Space Business Information Center is refining its scope and procedures to inform the business community about the space program in a cost-effective way.

During Phase II, the Center developed into an easily accessible and respected source of information for space businesses. The next phase of research will investigate whether or not the Center has a viable long-term role in the space business community.

#### 3.1 Goals

The primary purposes of Phase III research are to firmly establish the products and services that the Center offers to the space business community, and to determine whether they can generate sufficient resources to achieve long-term viability.

The following characteristics will distinguish the Phase III research program.

##### 3.1.1 Focus

The time for exploration is past. The Center must solidify its space industry market niche and cultivate it to ensure



long-term survival. The Center also must concentrate its efforts on projects that enhance the development of this focused approach.

### 3.1.2 Product

An information center is a service and -- as information becomes more voluminous and complex -- businesses rely increasingly on information services. However many persons still are more accustomed to purchasing products than services. People need to "see" before they "buy". In addition, products can be mass-produced and widely distributed more easily than services can, and are more susceptible to technological advances that lower cost.

Because of the widespread product-orientation in the business community, the Center has had difficulty establishing itself as a service center. Its identity and mission are unclear. The Phase III program will rectify this problem by placing greater emphasis on the creation and dissemination of information products while maintaining the Center's service-orientation.

### 3.1.3 Analysis

The most helpful criticism the Center received is that facts by themselves are not particularly useful. The Space business community needs value-added analysis that puts those facts in

context and explains their implications. The Center must provide analytical products in addition to information in order to perform a valuable service for clients.

#### 3.1.4 Revenue

If something is free, many believe, it must not be worth much. To date, the Center has provided information free to U.S. citizens and organizations. It is now time to test how much that information is worth by charging for it. The revenue generated will be important to the Center's long-term viability, but by itself will not fund the facility's operation.

### 3.2 Space Business Research Center

The first important modification of the Center has been to change its name to reflect its new direction. The results of Phase II indicate that data and raw information are not as valuable to clients as value-added analysis. Since an endeavor must emphasize whatever portion of its operation is most useful to potential clients, the Center will now concentrate on research. The new change symbolizes this new focus. The term "research" connotes products and services more valuable than unrefined information, and which clients are more likely to purchase.

### 3.3 Statement of Purpose

The second major modification will help give clients a clear understanding of the Center and its activities. Accordingly, the Center has adopted a new statement of purpose, which follows.

The Space Business Research Center conducts research on the commercial aspects of the international space industry.

The core of the Center's research capability consists of an extensive library and comprehensive set of databases on the space industry. The Center can obtain additional materials through electronic and hardcopy distribution channels.

The Center uses this information to serve its clients in four ways.

1. Clients can obtain specific information on the space industry or any of its market segments by requesting it. The information includes lists of firms in the industry and their capabilities, lists and characteristics of space technology, the economics of the industry or its markets, space law and government regulations. To achieve rapid turnaround at low cost, the information is drawn from existing sources. Analysis and interpretation are added by Center staff.
2. Clients may purchase Center publications, including analytical reports, guidebooks on space markets, and a quarterly journal on the space industry.

3. Clients may attend **business seminars** on the space industry. Custom-designed seminars are available for corporations or groups interested in exploring the strategic significance of space as an element of their long-term business plans.
4. Clients may contract for **proprietary research** on the status and future of the space industry or any of its market segments. The Center specializes in economic analysis and market forecasts in the space industry.

### 3.4 Resources

The Center must maintain an adequate set of library and database material to support these products and services. The materials which the Center currently holds are listed below.

#### 1. Electronic databases

- . Major free world launches (1958-present)
- . Launch vehicles' characteristics
- . Launch sites' characteristics
- . Existing communication satellites
- . Remote sensing platforms and sensors
- . Shuttle payloads (primary and secondary)
- . 1986 Battelle launch projections
- . Organizations engaged in space transportation, satellite communications, and remote sensing

#### 2. Printed directories (that can be converted into electronic form for analysis)

- . All launches (1957-present)
- . All operational satellites
- . Free world launch vehicle manifests
- . Planned communication satellites
- . Shuttle payloads (press information)

#### 3. Market Studies - space transportation

- . 1986 Battelle Outside Users Payload Model (latest published).
  - . Cape York International Spaceport: Commercial Opportunities Study, July 1987
  - . Evaluation of the Potential for Space-related Activities in the State of Hawaii, August 1987
- NASA is currently sponsoring a market study on the small vehicle market that will be released later this year.

#### 4. Information Retrieval

- . Bibliographic citations that can be electronically searched and retrieved from the following sources:

- Aerospace Database (covers NASA/RECON, AIAA, IAF)
  - DMS (covers all civilian and military space systems)
  - PTS Aerospace and Defense Markets and Technologies (business information on the space industry)
  - NTIS (all U.S. government publications)
  - and over 200 other databases.

- . The full text of citations can be electronically searched and retrieved from the following sources:

- Aviation Week and Space Technology (and other McGraw-Hill publications)
  - Space Business News
  - Space Commerce Bulletin
  - Satellite Week
  - Defense Daily,
  - and Space Daily.

- . The Center also has original copies of most of these publications from January 1987 to the present.

#### 5. Computer Resources

- . Workstations -

- 2 IBM-AT microcomputers with 30 mb disks
  - 1 Toshiba 3100 (80286 portable) with 10 mb disk
  - 1 Telex 1280 with 20 mb disk
  - 1 IBM-XT microcomputer with 10 mb disk

- . Shared resources -

- Vax 11/785 minicomputer with VMS
  - IBM 4381 mainframe computer with VM/CMS
  - Shared resources linked via Ethernet

. Computer software experience

NOMAD2 -- 4GL mainframe database management system  
dBase III, Reflex -- workstation DBMS's  
Word Perfect, Wordstar -- word processing  
SAS, SPSS -- statistical analysis  
Lotus 1-2-3 -- spreadsheet  
Mite -- telecommunications  
Kermit, Xmodem and Procomm -- binary file transfer

. Electronic mail systems

PROFS -- NASA/JSC administrative E-mail system  
NASAMAIL -- Telenet-based NASA long-distance system  
DECMAIL -- DEC VAX mail system  
MCI -- commercial E-mail system  
SPAN -- NASA space science E-mail system  
AdaNET -- emerging Ada-oriented E-mail system

APPENDIX A  
SPACE BUSINESS RESEARCH CENTER  
BEHAVIORAL DATA

Table 1  
Number of Contacts by Month

Month	Number of Contacts	Number of Questions
FEB87	3	3
MAR87	5	7
APR87	3	3
MAY87	7	11
JUN87	6	11
JUL87	10	12
AUG87	18	23
SEP87	28	59
OCT87	23	30
NOV87	29	55
DEC87	31	35
JAN88	31	35
FEB88	33	53
MAR88	23	35
APR88	24	39
Total	274	411

Activity by Month

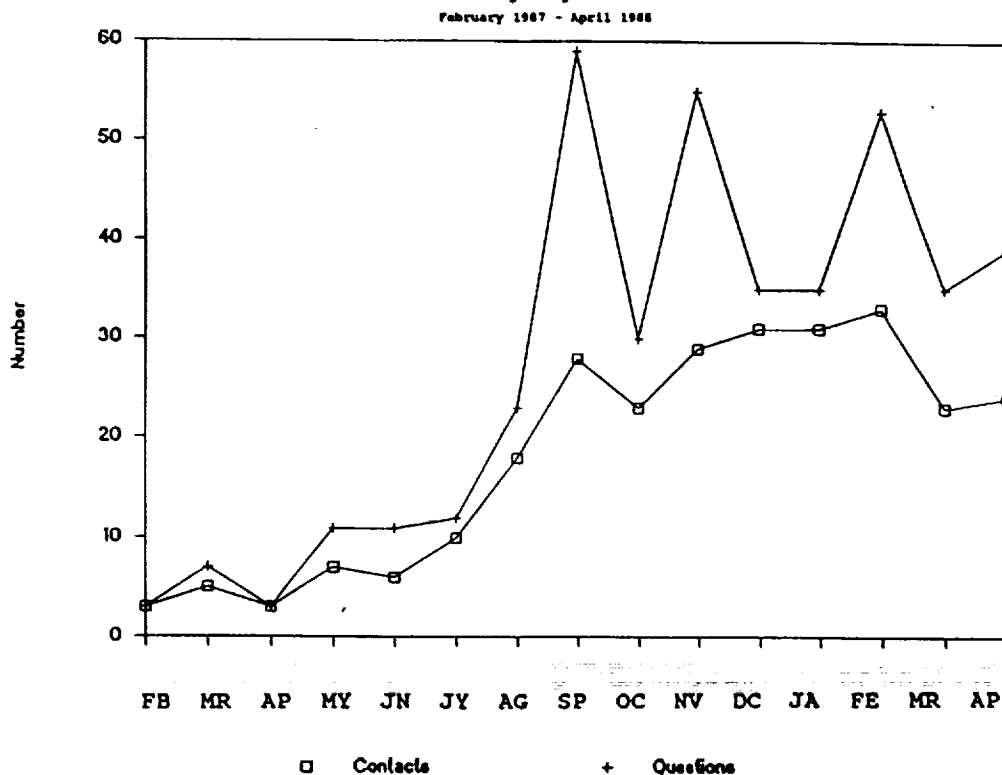




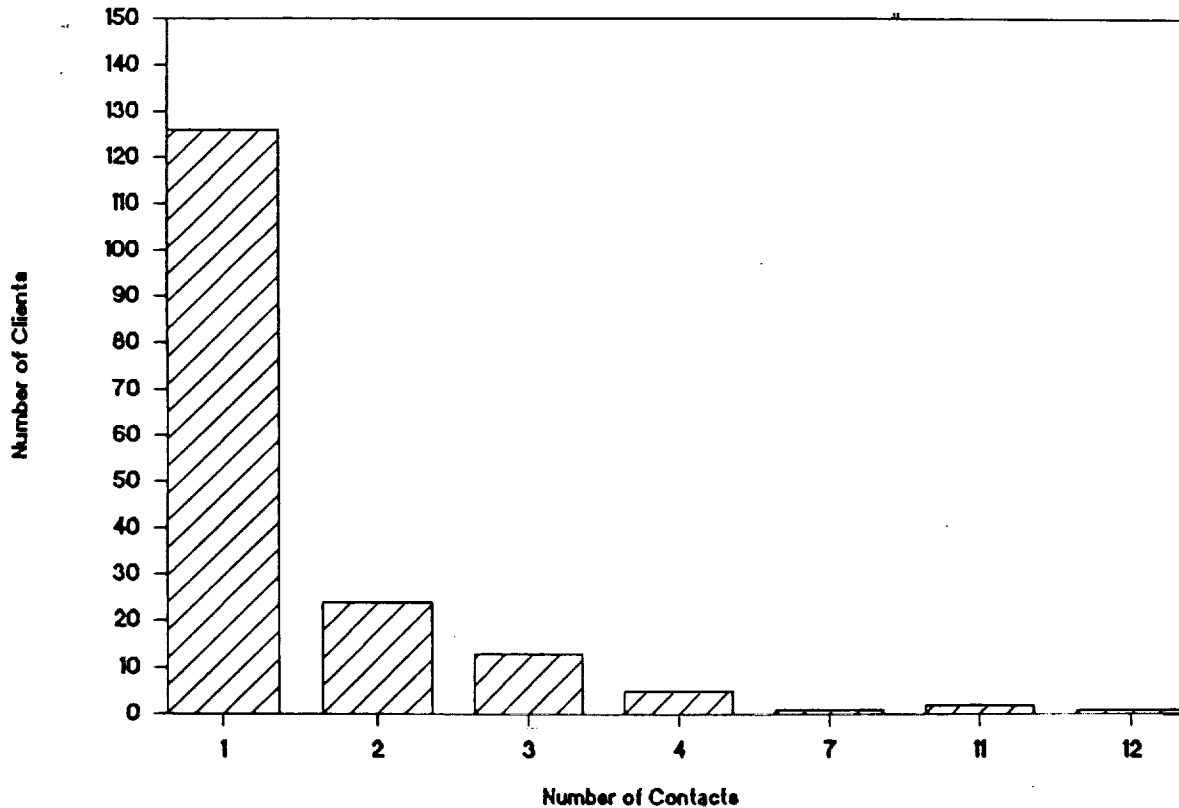
Table 2

Distribution of Client Contacts  
February 1987 - April 1988

Number of Contacts	Number of Clients	Percent
1	126	73%
2	24	14%
3	13	8%
4	5	3%
7	1	1%
11	2	1%
12	1	1%
TOTAL	172	100%

Distribution of Client Contacts

February 1987 - April 1988



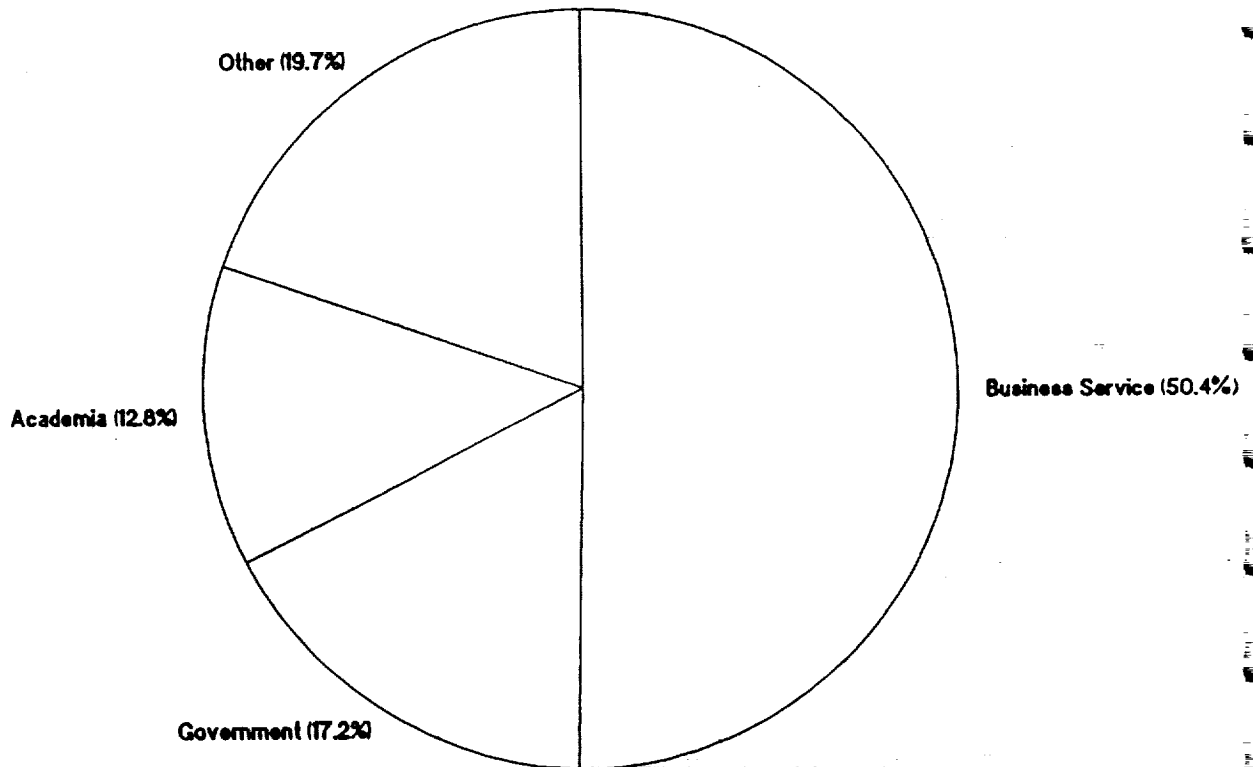
**Table 3**

**Number of Contacts by Client Category  
February 1987 - April 1988**

	Number	Percent
Academic	35	13%
Business Service	138	50%
Government	47	17%
Information Companies	14	5%
Large Aerospace	10	4%
Media	6	2%
Miscellaneous	7	3%
Small Aerospace	17	6%
TOTAL	274	100%

**Contacts by Client Category**

February 1987 - April 1988



**Table 4**  
Number of Contacts by State

State/Area	Number	Region
MD	6	DC
DC	40	DC
VA	6	DC
IN	1	MW
ND	2	MW
OH	1	MW
MI	1	MW
KS	1	MW
MN	9	MW
IL	2	MW
MA	1	NE
PA	3	NE
NY	4	NE
AL	3	SO
FL	17	SO
KY	1	SO
LA	2	SO
MS	5	SO
TX	148	TX
CO	1	WE
CA	12	WE
NM	2	WE
ID	1	WE
AZ	1	WE
UNKNOWN	2	-
Total	274	

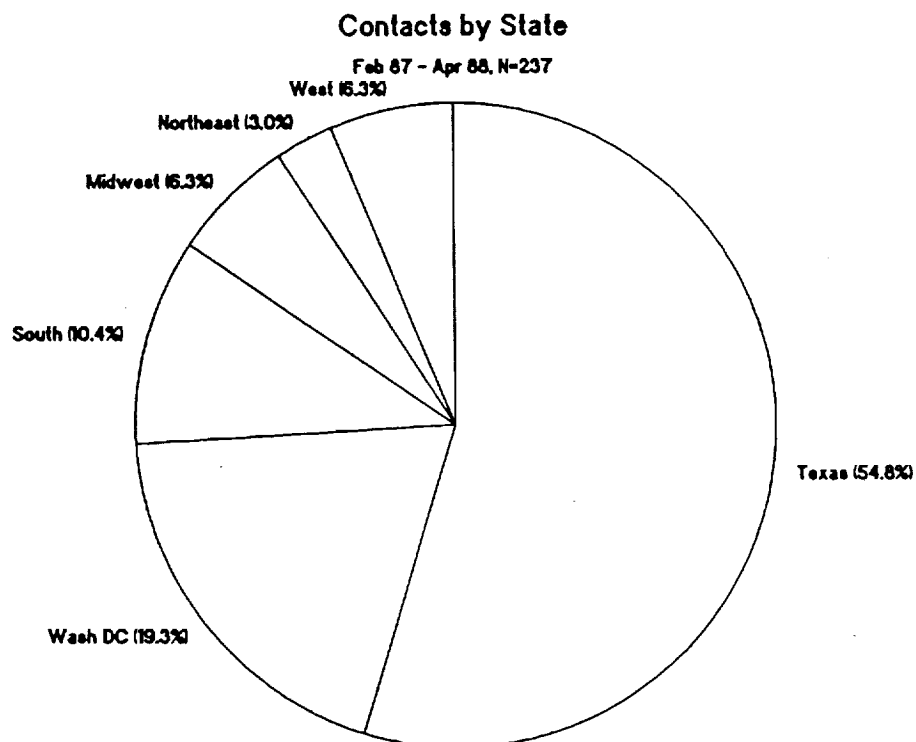


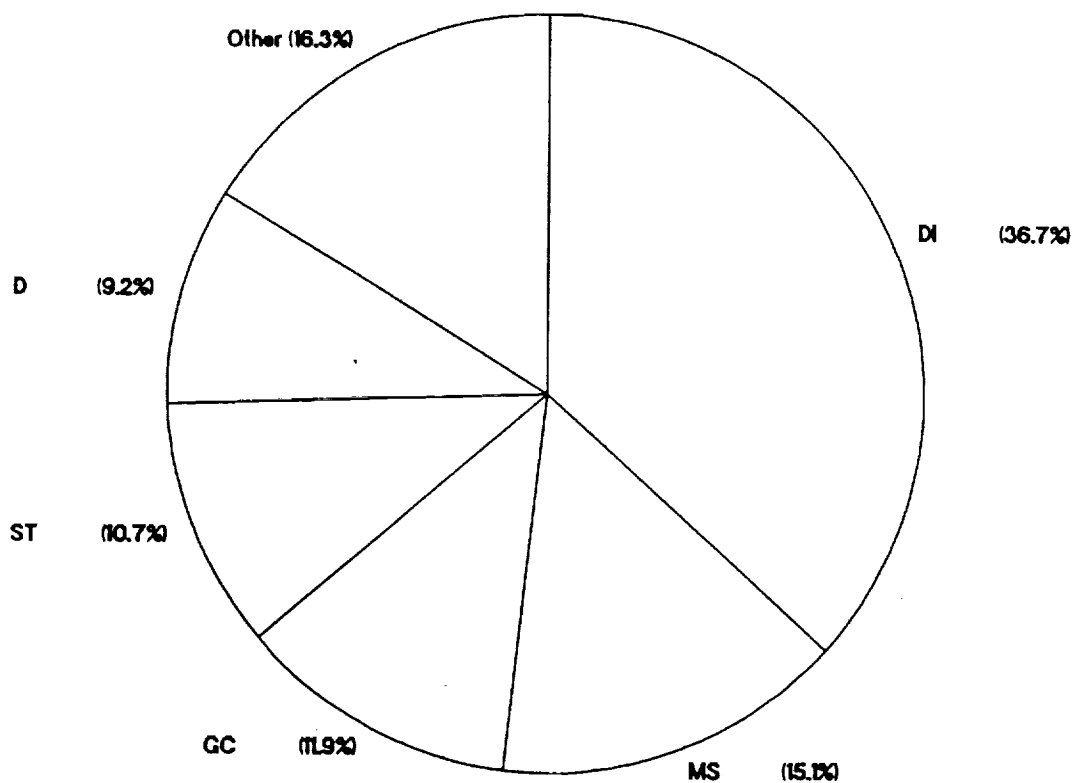
Table 5

Number of Questions by Question Category  
February 1987 - April 1988

Category	Number
Directories	151
Market Studies	62
Government Contracting	49
Space Technology	44
Documents	38
Law and Policy	22
Economic	15
Education	7
Miscellaneous	23
Total	411

Number of Questions by Question Category

Feb 87 - Apr 88, N=411



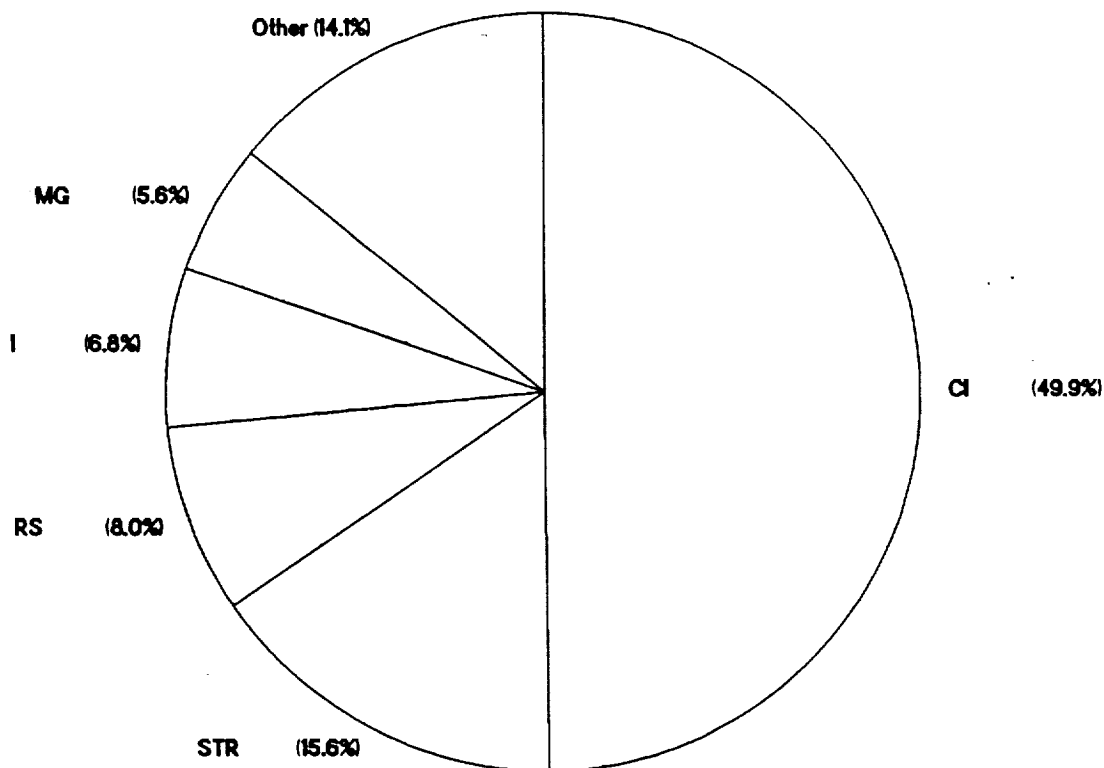
**Table 6**

**Number of Questions by Market Category**  
February 1987 - April 1988

Category	Number
Competitive Intelligence	205
Space Transportation	64
Remote Sensing	33
Internal (SBRC)	28
Microgravity	23
Technology Transfer	15
Space Station	13
Satellite Communication	13
Other	17
Total	411

**Number of Questions by Market Category**

Feb 87 - Apr 88, N=411



## APPENDIX B

### MARKET CATEGORIES

SS: SPACE STATION  
SC: SATELLITE COMMUNICATIONS  
STR: SPACE TRANSPORTATION  
RS: REMOTE SENSING  
MG: MICROGRAVITY, INCLUDING BIOTECHNOLOGY  
TT: TECHNOLOGY TRANSFER  
I: INTERNAL (WHAT DOES SBRC HAVE, "WHAT CAN YOU DO?")  
CI: COMPETITIVE INTELLIGENCE (BUSINESS PLANS AND CURRENT  
ASSESSMENT INFORMATION--OPPORTUNITIES; BACKGROUND  
INFORMATION ON PEOPLE, COMPANIES, NATIONS)

## CATEGORIES OF INFORMATION REQUESTS

(MS) Market Studies:	Applications of space technology, feasibility studies, market forecasting, market analysis
(GC) Government Contracting:	Status of existing contracts, RFP's and other procurements
(ST) Space Technology:	Physical infrastructure, launch vehicles, payloads, experiments
(EC) Economic Studies:	Macroeconomic and space industry analysis
(LP) Law and Policy:	Space law and impact of government policy; congressional activity
(DI) Directory Information:	Lists of names, addresses, phone numbers, etc.
(D) Documents:	Copies of publications
(E) Education:	Curriculum and course development
(M) Miscellaneous	Other

## CATEGORIES OF USERS

### Private Sector - identified by primary SIC Code

Large Aerospace:	Companies such as Boeing, Rockwell, Lockheed, etc.
Small Aerospace:	Small start-up companies such as Space Services, Inc.; NASA contractors; and JSC Vendors. Small business contractors.
Business Services:	Accounting, Architecture, Consulting, Insurance, Investment, Law, Marketing and Engineering.
Information Companies:	Companies that sell information, products and services to a mass market, and the media.

### Public Sector

Academia:	Universities, students, libraries
Government:	Agencies and departments, or personnel employed by federal, state or local entities.
Miscellaneous:	Entities or individuals that don't fit in another category.



# APPENDIX C

## SPACE BUSINESS INFORMATION CENTER PILOT STUDY QUESTIONNAIRE

### 1. HOW EASY WAS IT TO CONTACT THE CENTER?

5	4	3	2	1
Easy		O K		Difficult
39	9	1	1	0

Mean: 4.72  
Responses: 50

### 2. HOW HELPFUL WAS THE PERSON WHO HANDLED YOUR REQUEST?

5	4	3	2	1
Very Helpful		Fairly Helpful		Not At All Helpful
33	13	3	1	0

Mean: 4.56  
Responses: 50

### 3. HOW SATISFIED WERE YOU WITH THE INFORMATION YOU RECEIVED?

5	4	3	2	1
Very Satisfied		OK		Very Dissatisfied
19	13	13	3	2

Mean: 3.84  
Response: 50

### 4. HOW SATISFIED WERE YOU WITH THE AMOUNT OF INFORMATION YOU RECEIVED:

5	4	3	2	1
Too much		Just right		Too little
0	8	23	12	7

Mean: 2.64  
Responses; 50

5. HOW QUICKLY DID YOU GET THE INFORMATION?

5	4	3	2	1
Rapidly		Timely		Slowly
17	8	21	3	1

Mean: 3.78

Responses: 50

6. HOW WOULD YOU RATE THE FORMAT OF THE INFORMATION YOU RECEIVED?

5	4	3	2	1
Excellent		OK		Poor
12	18	14	2	0

Mean: 3.83

Responses: 46

7. HOW WOULD YOU RATE THE MANNER IN WHICH YOU RECEIVED THE INFORMATION (i.e., telephone, post, delivery service, electronic mail, etc.)?

5	4	3	2	1
Excellent		O K		Poor
19	20	9	0	0

Mean: 4.17

Responses: 48

8. HOW USEFUL WAS THE INFORMATION TO YOU?

5	4	3	2	1
Very Useful		Somewhat		Not Useful
20	14	7	4	4

Mean: 3.89

Responses: 49

9. HOW MUCH DO YOU THINK THE INFORMATION YOU RECEIVED IS WORTH?

Range: \$2 - \$6,000

Median: \$50 - \$100

Responses: 19

9a. WOULD YOU PAY THAT AMOUNT?

YES 15 NO 2

9b. PLEASE INDICATE HOW MUCH YOU WOULD PAY FOR THIS INFORMATION.

\$ \_\_\_\_\_

10. DO YOU HAVE ANY OTHER COMMENTS OR SUGGESTIONS?

Comments:

The people in Washington know more than SBIC does. SBIC's service is very important and could be extremely useful if you could keep on top of what is going on and provide info I can't get.

Very pleased with the results of a market evaluation study of possible government-NASA matches for our products and services.

Will use SBIC again. Very pleased.

Will be using SBIC again. Very supportive.

Good introduction to technology of space.

Another service was much more comprehensive; info from them was voluminous and well structured.

Good service, but I don't think industry will pay much for it.

Excellent operation

Good job. I'll use it again.

You get a gold star!

Overall a good service, but would have liked more info.

Boulder Center for Science and Policy has the edge on SBIC - doing the same thing but better.

SBIC needs an expanded data base.

Has the potential to be a great service for interested parties.

Found out about you through NASA.

Wanted detailed info, not bits and pieces. Ames had detailed info.

**Suggestions:**

Use standard format to better identify the request, purpose for info.

Spend more front-end time defining the request.

On-line access would be helpful.

Need more familiarity with subject matter.

Print a weekly newsletter and charge \$50.00 a year.

Location is a liability. Provide an on-line search service.

Advertise in industry journals.

Search with microfisch.

Be more specific about services available.

Offer a FAX subscription.

Seriously consider subscriptions.

Do advertising and PR work.

Conduct industry seminars.

List services on various electronic boards.

Get a bulletin board and uplink service.

Need better screening of directory type info.